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Letter to the Editor

Late evening meal consumption and cardiometabolic risk factors

Madjd *et al.* conducted a randomised clinical trial to evaluate the effect of late (LEM) *v.* early evening meal (EEM) consumption on weight loss and cardiometabolic risk factors in women during a weight loss programme[1]. EEM group (eating at 19.00–19.30 h) and LEM group (eating at 22.30–23.00 h) were set for a trial. The EEM group had a greater mean reduction in weight, BMI, waist circumference, total cholesterol, TAG and homoeostasis model assessment of insulin resistance after 12 weeks. Regarding the benefits of eating an earlier evening meal on weight loss and plasma cardiometabolic risk markers, I have two comments with special reference to sleep and timing of meals.

First, Gu *et al.* conducted a randomised crossover trial to evaluate the effect of late dinner (LD, 22.00) *v.* routine dinner (RD, 18.00) consumptions on nocturnal metabolism in healthy volunteers with a fixed sleep period (23.00–07.00)[2]. Although LD did not affect sleep architecture, there was an increased plasma cortisol in habitual earlier sleepers with LD. In addition, increased nocturnal glucose intolerance, reduced fatty acid oxidation and mobilisation were observed in earlier sleepers with LD, which might promote obesity. Namely, there was an association between LD consumption and nocturnal metabolic disorders, especially in habitual earlier sleepers. In addition, the same authors examined the effect of RD and LD consumptions on sleep quality[3]. Although there was no significant difference in overnight sleep architecture, LD caused a 2·5 % initial increase in delta power and a reciprocal 2·7 % decrease in combined α and β power, presenting that LD was associated with deeper sleep in the beginning of the night. St-Onge *et al.* also reported that timing of sleep and meals might influence food choice and energy balance in healthy adults with overweight/obesity[4], and the relationship between poor cardiometabolic profiles, including obesity, and LD consumption should be evaluated in combination with sleep quality.

Second, Dashti *et al.* evaluated the effect of late lunch consumption on subsequent cardiometabolic risk traits and weight loss[5]. They stratified participants into early (before 14.54) and late (after 14.54) lunch eaters, and late lunch eaters had higher BMI, higher concentrations of TAG and lower insulin sensitivity compared with early lunch eaters prior to intervention. In addition, late lunch eaters had higher concentrations of the satiety hormone leptin in the morning, and OR of late *v.* early lunch eaters for having weight loss barriers and for weight loss were 1·22 (95 % CI 1·03, 1·46) and 0·81 (95 % CI 0·66, 0·99), respectively. These results present that late lunch consumption has also adverse effects on weight control, and timing of lunch and dinner should be simultaneously evaluated for the risk assessment of cardiometabolic risk factors.

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